

**WHAT IS CLAIMED IS:**

1. A method for decoding a video stream, comprising:

maintaining a DCT bit stream table in a storage medium,

5 wherein the DCT reference bit stream table includes pairs composed of DCT reference bit streams and block pixel data, the block pixel data providing inverse-DCT information of the corresponding DCT reference bit stream;

looking up the DCT bit stream table when receiving a DCT input stream to find whether the DCT input bit stream matches a DCT reference bit stream; and  
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utilizing the block pixel data corresponding to the matched DCT reference bit stream to generate inverse-DCT data of the DCT input bit stream if the DCT bit stream table includes the matched DCT reference bit stream.

15 2. The method of claim 1, further comprising the steps of decoding the DCT bit stream and saving the decoded result into the DCT bit stream table if the DCT input stream fails to match any DCT reference bit stream in the DCT bit stream table.

20 3. The method of claim 2, further comprising the step of compressing the decoded result saved in the DCT bit stream.

4. The method of claim 1, wherein the DCT input bit stream and the DCT reference bit stream are matched if the DCT input bit stream and the DCT reference bit stream are identical.

5. The method of claim 1, wherein the DCT input bit stream and the DCT reference bit stream are matched if a difference of the DCT input bit stream and the DCT reference bit stream is lower than a predetermined threshold.

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6. The method of claim 1, further comprising a step of representing a target block with a decompressed block pixels' within neighboring blocks if a compressed stream of the previously saved block streams is identical to a target block stream. 7. The method of claim 1, wherein a threshold value is compared to a weighted difference of compressed DCT coefficients of at least one previously saved block and a target block for determining the similarity.

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8. The method of claim 7, wherein a weighted difference between at least one previously saved block stream and a target block stream is applied to determine whether a lossy decoding is applied in decompressing the video bit stream.

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9. The method of claim 8, wherein one of previously saved decoded blocks is selected to represent a target block if a weighted sum of DCT coefficient difference between a target block and the closest block saved in the storage is less than a predetermined threshold;

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10. The method of claim 1, wherein a compressed bit stream and the corresponding decoded pixels of farer distance from a target block can be

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overwritten when the storage device of storing compressed bit stream and decoded pixel is short of space.

11. The method of claim 1, wherein a decompressed bit stream is  
5 compressed before being stored to a buffer for future representing a new block stream.

12. The method of claim 1, wherein a decompressed bit stream is  
compressed through a lossless compression mechanism before being stored to  
10 a buffer and is decompressed for future representing a new block stream.

13. A method of lossless block pixel compression, comprising:  
subtracting a pixel value from a predicted value to form a pixel difference  
matrix;

15 applying a "Run-Length" packing for re-arranging the pixel difference matrix into a pair of data; and

using a VLC coding scheme to reduce the amount of bit of representing the pixel difference patterns.

20 14. The method of claim 13, wherein a predicted pixel is calculated by an average of the weighted values of surrounding pixels.

15. The method of claim 13, wherein the surrounding pixels are pixel from left and top of a target pixel.

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16. An apparatus for decoding a video stream, comprising:  
a storage device for storing compressed data stream and  
corresponding decompressed pixel data of at least one previous block ;  
a device for comparing a coming compressed stream to at least one  
5 previously saved stream; and  
a device of selecting one of previously saved decoded blocks to  
represent a target block if a target block is identical to one of the previously  
saved blocks.

10 17. The apparatus of claim 16, wherein an output of a comparator is used  
to select the decoded pixels to represent the target block pixels.

18. The apparatus of claim 16, wherein decoded block pixels represent  
the target block pixels by copying the decoded block pixels.

15 19. The apparatus of claim 16, wherein the surrounding pixels are pixel  
from left and top of a target pixel.

20 20. The apparatus of claim 16, wherein in decompressing an I-type frame  
and JPEG still pictures one of previously decoded and saved blocks is selected  
to represent the target block without going through a motion compensation  
device.

21. The apparatus of claim 20, wherein in decompressing an I-type frame  
and JPEG still pictures one of previously decoded and saved blocks is selected

to represent the target block without going through a motion compensation device.

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